

CHAPTER III - STORM DRAINAGE

310 GENERAL

The City of Beaverton has adopted the Unified Sewerage Agency's Resolution and Order 96-44. All construction standards must meet or exceed these requirements.

The City of Beaverton Code, and the Development Code (Ordinance 2050), have established the requirements for the design of facilities intended to protect the public health, safety, and welfare from damage due to flooding. Beyond that level of protection, additional measures are specified in this chapter which are intended to minimize any potential flooding damage and allow for efficient operation, repair, and maintenance of the storm drainage system.

Provisions must be made for gravity drainage of roofs and foundation drains for all new buildings and structures. For multi-family residential, commercial, or industrial developments, these drains shall be piped directly to the storm drain system. In single family residential developments, these drains shall be piped to the street gutter or directly to the public storm drain system. The connection to the street gutter must be through a three (3) inch plastic pipe set in the curb during construction or bored through an existing curb (see Standard Drawings). In single family residential developments where topography prevents connecting foundation and roof drains as required above, drains for each lot shall be directly piped to the public storm drain system; pipe and easement requirements shall conform to Section 130.6 of this Manual.

These requirements shall apply to all storm drainage facilities in existing and proposed public right-of-way, public drainage easements, and tracts of common ownership in the City. Storm drainage systems include, but are not limited to: inlets, pipes, ditches, creeks, rivers, wetlands, and storm water quality and quantity facilities.

The City has adopted USA standards with the following notations:

1. Storm water quantity management requirements are amended by Section 330 of this manual.

2. All steps within structures must comply with OSHA standards. There shall be no more than 24 inches between the top of the casting and the rung of the top step.
3. No more than eight (8) inches of riser rings shall be used.
4. All inside drops and pollution control structures must be constructed with pipe; no partitions will be allowed.
5. All inside drops and pollution control manholes must be 60 inch or larger diameter structures.
6. All pipe shall be installed with water tight joints.
7. All backfill material shall be referenced per APWA standards.
8. No private storm sewer shall be located within any lot other than the lot which is the site of the building or structure served by such sewer. The exception to this will be common areas in planned unit developments, and/or City right-of-ways, or as otherwise approved by the City Engineer.
9. For signs identifying permanent surface water quality and quantity facilities, the City of Beaverton logo shall be placed on the sign in addition to the Unified Sewerage Agency Surface Water Management logo.
10. All intersections of public lines shall have an approved structure.

320 TELEVISION SCANS

The City will scan all new public storm pipe along with existing sections of pipe which are disturbed or affected by new construction. Prior to requesting a television scan, the contractor shall flush, clean, and remove all debris from the system and shall string all lines with nylon cord (or equivalent) having a minimum test strength of 250 pounds. The string ends shall be tied to the top rung of the steps in each structure.

330 WATER QUANTITY STANDARDS

All development on sites one-half (0.5) acre or greater in area shall be required to provide on-site detention. For sites smaller than one half acre in area or where storm detention would have an adverse affect upon the receiving storm drainage system, as determined by the City Engineer, a system development charge will be assessed in lieu of a constructed facility.

Storm detention facilities shall be designed to provide storage using a 25 year event, with the safe overflow conveyance of the 100 year storm. Calculations of site discharge for both the existing and proposed conditions shall be required using the King County Hydrograph V4.20. Storms to be evaluated shall include the 2, 10, 25, and 100 year events. Allowable post-development discharge rate for the 2, 10, and 25 year events shall be that of the pre-development discharge rate, with a maximum allowable release rate of one half (0.5) cubic feet per second per acre in the 25 year event. An outfall structure such as a "Vee-Notch" weir or multiple orifice structure shall be designed to control the release rate for the above events. No flow control orifice smaller than 2.5 inches shall be allowed. If the allowable release rate can not be met with all the site drainage controlled by a single 2.5 inch orifice, the allowable release rate provided by a 2.5 inch orifice will be considered adequate at the discretion of the City Engineer.

When using the King County Hydrograph V4.20 (or newer version), use the following precipitation depths for the 24 hour storm:

<u>EVENT</u>	<u>INTENSITY</u>
2 YEAR	2.5 inches
10 YEAR	3.5 inches
25 YEAR	4.0 inches
100 YEAR	4.5 inches

If a site is proposed to be constructed in phases, the first phase shall have a storm water quantity facility designed and built to accommodate the ultimate development of the site.

When the above storm detention requirement is to be met by creating a ponded area in a parking lot, the following shall apply:

- A. Maximum depth of standing water in all parking lot ponds shall be one (1) foot. No more than 25 percent of the entire number of parking stalls

in a parking lot shall be inundated by a parking lot pond during the design storm.

- B. No parking lot ponds shall be located within the primary ingress/egress portions of a site. Parking lot ponding shall be so designed that, at maximum water level for the design storm, a minimum twenty (20) foot wide emergency vehicle lane to the buildings will remain unflooded, including during system overflow condition.
- C. Slopes on all parking lot surface ponds should not be less than one (1) percent nor exceed five (5) percent in areas designed for vehicular traffic.
- D. All parking lot ponds shall be designed and constructed in such a manner so as to provide a maximum water surface elevation 0.25 feet lower than any and all structures designed to contain the ponding.
- E. Where curbing is used to contain a parking lot pond, extruded curbing shall not be used. A public standard "vertical" type curb will be required.
- F. No parking lot ponding shall occur at an elevation more than one (1) foot below the lowest habitable floor elevation of buildings within the proximity of the pond. Under no circumstances shall ponds or other detention facilities be designed in such a manner that system failure would cause flooding in any habitable building area.
- G. No parking lot ponding shall be designed for parking lots under buildings. Whenever the possibility of flooding an underground parking facility or other uninhabited building area exists, care shall be taken to floodproof electrical equipment areas and other building appurtenances with overflow and/or private pump systems being provided to drain such a flooded facility.
- H. Parking lot pond construction plans shall include a note stating that "Grading is critical to functioning of detention system and plan must be strictly followed." Parking lot design volumes shall be shown on the plans and the pond volume inspected prior to paving. The Engineer or Architect shall certify that the design pond volume has been constructed.

340 WATER QUALITY STANDARDS

The minimum standards for the design and construction of storm water quality facilities in the City of Beaverton shall be the same as the current standards of the Unified Sewerage Agency.

If a fence is required to be provided, in addition to the standard USA requirements, it shall be brown vinyl clad chainlink (unless otherwise approved by the City Engineer) with a top bar added.

End of Chapter